SAFETY MANUAL

City of Annapolis

for the use of City of Annapolis Employees

June 2003

Safety Manual

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Safety Policy Statement

Safety is a basic responsibility of both the administration and the employee. It is the first consideration in the operation of City business. The protection of all City employees against occupational accidents and health hazards is of primary concern. Medical expenses and time-loss compensation payments are drawing tax dollars from essential services and programs. Injuries result in long- and short-term disability for employees, also causing their inability to enjoy a high quality of life.

Each department head shall implement and aggressively support our safety program by:

- Providing personal leadership and achieving satisfactory results.
- Taking the initiative in the establishment and maintenance of safe practices and workplaces for each employee under their supervision.
- Considering safety as an integral part of time, production, cost and quality of work.

All employees are expected to follow safe practices. They shall:

- Cooperate with the safety program so that work can be conducted in such a manner to ensure personal protection for everyone.
- Follow all safety rules, take no unnecessary chances, use all safety guards and safety equipment, and make safety a part of the job.
- In general, help enforce and support the safety program.

We must all make an effort to reduce accidents. We must be alert in detecting and taking steps to remedy potentially hazardous conditions. Above all, employees must exercise concern for others to help guarantee everyone's safety, well-being and productivity.

Purpose

The purpose of the City of Annapolis Safety and Loss Prevention Program is the prevention of accidents and occupational illness. Program responsibility is assigned to all levels of City government. In order to have effective results, we must direct our efforts to a well planned, organized and coordinated program, which will minimize unnecessary losses.

The objective is to:

- Reduce pain, suffering and associated costs of employee injuries and occupational illnesses.
- Decrease the City's liability exposure.
- Decrease operating costs through conservation of City property, equipment and facilities.

Every accident has a cause and almost every cause can be eliminated or controlled.

Through the training of employees, elimination of unsafe conditions and providing personal protective equipment, we can reduce accidents and injuries.

This manual will help to instruct you in safe work practices. The rules and regulations contained within are general and pertain to a variety of work within the City. Each job, however, involves unique circumstances and no manual can hope to foresee every condition that may arise on the job. Supervisors are responsible for providing their employees with supplement regulations. If you are unclear, confused or concerned about the proper safety procedure for a specific task, you should ask your supervisor for further instruction.

Responsibility

All City employees share the responsibility for accident prevention and should be aware of safe methods, procedures and regulations related to their job.

Some general safety guidelines for all City employees are:

- Report any unsafe conditions immediately to your supervisor for corrective action.
- Inspect all tools and equipment for any unsafe condition prior to use.
- Keep work area clean and orderly.
- Operate only authorized equipment and machinery.
- Follow all Standard Operating Procedures.
- Use personal protective equipment when required.
- Report all injuries immediately to your supervisor.

The Risk Management Committee in conjunction with the Safety Committee has the responsibility for the implementation and administration of the City Safety and Loss Prevention Program.

All levels of supervision, including employees directly in charge of a job, are responsible for safe, properly planned working conditions.

It is the duty of each employee to know and follow the regulations which pertain to any work he/she might perform. This includes the application of regulations outlined in this manual and the use of common sense in all situations. You should never put yourself or your fellow employees in danger.

Personal Protection Equipment

When the use of personal protective equipment has been specified by the department, its use will be MANDATORY. Employees will be held accountable for reporting to the job site with all issued personal protective equipment. Supervisors will be held accountable to ensure that each employee has the specific safety equipment necessary to perform the job safely. Hard hats, goggles, gloves, safety shoes, safety vests and other types of approved personal protective equipment are provided by the City for the employees' safety. Never proceed with any task without the proper protective equipment. Maintaining this equipment is the responsibility of the employee. All persons, including workers on the job, assistants, and observers in close proximity to potential hazards, shall wear the proper personal protective equipment as follows:

- Head Protection to protect the head against falling objects, head bumping situations or electrical conductors. The suspension and shell of the hard hat is crucial to the protection it provides and must never be altered. Never remove the suspension nor drill ventilation holes in the shell. These alterations seriously affect the structural integrity and therefore the protection it provides.
- Eye and Face Protection, face shields or safety glasses are to be worn to guard against airborne debris, dust, flying particles, chips, chemicals, heat or injurious rays.
- Protective Clothing such as gloves, aprons, leggings, sleeves and full suits shall be worn to protect against wounds, abrasions, bumps, heat, chemicals or melted metals. Do not wear gloves when working around rotating parts or moving machinery.
- Foot Protection shall be worn to protect against hazards which may result in foot injuries. Tennis shoes, soft-topped shoes and similar apparel are prohibited for use at all work sites with the exception of office personnel.
- Traffic Safety Vests will be worn by all personnel who are exposed to vehicular traffic hazards while performing work on any roadway.

- Hearing Protection or ear muffs will be worn to guard against prolonged exposure to noise exceeding sound tolerance levels defined by law.
- Drowning Protection shall be worn when any danger of drowning exists.
- Breathing Protection, airline respirators, and self-contained breathing apparatus shall be worn to protect employees from harmful exposure to toxic or irritating gases.

Driving Policy

Driver Selection

Every applicant for City employment who will be involved in the operation of a City vehicle will provide proof of a driver's license of the proper class and with the proper commercial driver's license endorsement required for the operator of the particular type vehicle or vehicles which he or she will be allowed to operate. Applicants must also provide a certified copy of their driving record.

Each department shall appoint qualified personnel to test all applicants for proficiency in operating specific vehicular equipment an applicant may be using. Each department will establish written standards and levels of proficiency which applicants are expected to meet in order to be hired. Each applicant must meet these standards.

Driving Records

All City employees whose jobs involve the operation of a City vehicle or their own vehicle while performing City business are registered with the Motor Vehicle Administration Special Attention Flag Program.

This program provides notice to the Risk Management Office of any changes appearing on an employee's driving record. These employees must maintain a satisfactory driving record, free of excessive point accumulation.

If an employee's driver's license is suspended, he or she must notify their supervisor immediately.

Definition - "Driving Required Position"

“Driving required positions" are positions whose duties require the operation of a motor vehicle under emergency conditions, or the operation of any vehicle which requires a commercial designation or special class of license, or the operation of a personnel carrier; and whose minimum qualifications require a valid driver's license of the proper class and/or commercial designation.

Employees in "driving required positions" whose driver's license is limited, non-renewed, revoked or suspended for thirty (30) days or more will be transferred to a currently vacant position which is not a "driving required position" or terminated for just cause.

Employees in "driving required positions" whose driver's license is suspended for less than thirty (30) days will be assigned duties that do not include operation of a vehicle, if such assignment is in the best interest of the City. Otherwise, the employee will be suspended for the duration their license is suspended.

Employees who are not required to drive, but whose license is limited, non-renewed, revoked or suspended will not be permitted to operate any vehicle including his or her own for the purpose of conducting City business.

Employees who are in "driving required positions" and who, as a result of driving while intoxicated, driving under the influence, reckless driving, leaving the scene of an accident or speeding, together or separately, and who accumulate three (3) to five (5) points will be disciplined with a five-day (5) suspension. If the accumulation of points reaches six (6) or more, the employee may be demoted to a currently vacant

position or may be terminated at the discretion of the department director. The employee will receive written notification (with a copy to the personnel file) not to drive any vehicle in the conduct of City business.

Employees who operate City vehicles or his/her own vehicle for City business but who are NOT in "driving required positions" and who as a result of driving intoxicated, driving under the influence, reckless driving, leaving the scene of an accident or speeding, together or separately, and who accumulate three (3) to five (5) points shall be disciplined with a three-day (3) disciplinary suspension. If the accumulation of points reaches six (6) or more, the employee will receive written notification (with a copy to the personnel file) not to drive any vehicle in the conduct of City business. Depending upon the necessity of driving to the position, the employee may be transferred to a current vacant position, terminated, or assigned alternate duties at the discretion of the department director.

Motor Vehicle Safety

Driver Training

City drivers are expected to know and obey all state and local traffic laws. Employees driving vehicles for the City are responsible for the safe use of the vehicle. Employees must operate vehicles in a safe, courteous manner to prevent property damage and injury to themselves and others.

Daily Inspection

Each department will develop a routine daily inspection of each vehicle it operates, to be performed by the driver at the beginning of a shift period. Such inspection shall include; all control indicators and devices essential for the safe and efficient use of the vehicle, also the condition of the exterior (clean/dirty/new damage) and of the interior (clean/dirty).

Seat Belts

All employees while operating City vehicles or any vehicle being used for City business must wear seat belts and the driver shall require all passengers to do the same. "City business" means any jobrelated duty while being paid or reimbursed by the City including business travel during non-work hours.

Vehicle Abuse

Any action or omission which results in damage to a City vehicle is considered vehicle abuse. Any evidence of vehicle abuse shall be investigated by the supervisor and could be cause for departmental disciplinary action. Some examples of vehicle abuse:

- Failure of driver to report defects or malfunctions.
- Failure to report exterior damage.
- Racing engine before normal operating temperature has been reached.
- Improper distribution of loads or overloading.
- Improper parking and securing.
- Riding or slipping the clutch.

Vehicle Misuse

Any unauthorized use of a vehicle which may or may not result in damage. Vehicle misuse could be cause for departmental disciplinary action. Some examples of vehicle misuse:

- Unauthorized person operating vehicle.
- Use of vehicle for other than official purposes.

- Unauthorized passengers.

Backing Vehicles

- Plan your route so that you avoid backing wherever possible.
- The driver, if not alone, will not attempt to back up unless someone is in back of the vehicle and is helping to guide the backing operation.
- If the driver is alone, the vehicle should not be backed until the driver has inspected the area surrounding the vehicle and found it clear of obstacles and pedestrians. When backing a long distance he/she must periodically recheck the conditions around the vehicle.
- Each department should develop more specific written instructions for backing those vehicles which are used in their particular operations.

Vehicle Parking

- The driver of a City vehicle shall not leave it unattended until the engine is stopped, the ignition locked, the key removed and the brake set.
- When parking on a grade, turn the wheels into the curb or side of the roadway and chock the wheel.

Disabled Vehicle

Whenever a City vehicle is disabled on a roadway, the driver shall display warning devices on the road during the time that the vehicle is so disabled.

End of Shift

All driven shall be responsible for 1) cleaning the interior of the vehicle at the end of their work shift and 2) refueling so that the vehicle is ready for immediate use at the beginning of the next scheduled work shift.

Accident Instructions

All drivers while operating any vehicle on City business, if involved in an accident, are required to:

- Remain at the scene - do not move vehicle (unless absolutely necessary).
- Call the police.
- Assist the injured to the extent of your first aid training.
- Protect the scene so no other vehicles/persons become involved.
- Obtain names, addresses, and phone numbers from other parties, witnesses and injured persons.
- Do not admit liability. Refer questions relative to liability to the Risk Management Officer in Finance.
- Report accident to your supervisor.
- Complete the vehicle accident or damage report and turn it in to your supervisor.

Insurance Information

You are insured by the City of Annapolis, Self Insurer:
Certificate Number 80
Claims Contact:
Riggs, Counselman, Michaels & Downs, Inc.
Self-Insured Services Co. (SISCO)
Doug Kerr, Claims Manager
410-339-5869
1-800-346-4075

Material Handling

Lifting and Carrying

Back injuries can frequently be avoided by taking a little time to size up what you are about to lift to be sure that you can handle the weight or size. Get help if a load appears to be more, either in weight or shape, than you can safely move or lift alone. Also, before you lift, inspect the object for nails, splinters, rough strapping, or other protrusions that might injure you.

Use the following procedures when you are ready to lift:

- Place one foot alongside the object and one foot behind it.
- Keep your back comfortably straight (it does not have to be vertical) and bend at your knees.
- Tuck your chin in toward your body to help keep your back in the proper position.
- Grip the object with the palms of your hands not just your fingers.
- Keep your arms and elbows close to your body.
- Draw the object toward you while keeping its weight and your body centered over your feet.
- Lift up straightening your legs.
- When setting a load down follow the lifting procedure in reverse.
- If you are lifting to a position above your waist, don't try to do it in one motion. First get the load waist high, then rest it on a support while you change your grip. Bend your knees again to involve your leg muscles in the final lift. Instead of lifting an object above your head, use a stepladder.
- Avoid using a twisting motion when moving an object. While carrying an item be aware of other things around you so that you don't mash your finger or hand or fall or trip.

Forklift Operations

- Use a forklift only if you are a trained and authorized operator. Make daily inspection of the horn, lights, tires, battery, controller, lift system, brakes and steering mechanism. Report any defects to your supervisor.
- Always use caution while driving a forklift. Never permit riders on a forklift or raise or lower personnel unless the lift is equipped with platform and safeguards designed specifically for this purpose.
- Always wear your seat belt and operate the forklift within its rated load capacity. Place the forks as far under the load as possible and tilt the blade backwards to prevent slippage. When traveling down a ramp, for additional safety, back down in low gear.
- When the forklift is not being used, neutralize the controls, shut off power, set the brake, put forks down and remove the key.
- Before loading a forklift onto a truck or trailer, make sure the bridge plate leading onto the vehicle is strong enough, wide enough, and that the plate is secured to prevent it from slipping. After it is loaded, block the wheels and set the brake.

Ladders and Scaffolds

Ladders

- Ladders should be placed so the distance from its foot to the wall is one-fourth ('/,) the length of the ladder. Angle the ladder so that it is one (1) foot out for every four (4) feet up.
- Always spread a stepladder correctly and never stand on the top step.

- Face the ladder when going up and down. Always look up when you are going up a ladder. Never climb a ladder with greasy, muddy or otherwise slippery hands and/or shoes.
- Only one person on a ladder at any time. Do not carry heavy objects up or down a ladder. Always use a rope hoist.
- As the work progresses, move the ladder. Do not work any further than an arm's length from the ladder.
- Do not use metal ladders in areas where contact with electric wires or equipment is possible.
- If a ladder must be placed in front of a door, block the door open, lock it, or have someone guard it.
- Damaged ladders must NEVER be used. Tag it out-of-service and notify your supervisor.
- Ladders should not be used for any purpose other than that for which they are intended.
- Never paint a ladder because paint will hide any cracks and splits.

Scaffolds

The following procedures should be followed:

- Only trained personnel should erect and work off of scaffolding.
- Make sure there is firm, level footing before installing upper levels.
- Make sure that the planking extends the entire width of the platform and is secured with cleats.
- Tie into structure or building to prevent tipping.
- All side braces and kickboards must be installed. Guard rails are required on all scaffolds and platforms.
- Never stand on the overhang portion of the scaffolding.

Confined Space

A confined space is large enough and so configured that it may also have restricted means for entry or exit (for example: tanks, furnaces, vessels, tunnels, vats, boilers, sewers, vaults, pits, storm drains, wells, etc.).

There are two classifications of confined spaces: non-permit confined space and permit-required confined space. The non-permit confined space is one that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious injury. A permit-required confined space is one that has one or more of the following characteristics:

- Contains or has the potential to contain a hazardous atmosphere.
- Contains a material that has the potential for engulfing an entrant.
- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross section.
- Contains any other recognized serious safety or health hazard.

Confined Space Evaluation

The supervisor shall perform a hazard evaluation of the confined space and initiate a Confined Space Entry Permit. Where applicable, the evaluation is to assess the potential for:

- Hazardous oxygen levels.
- Flammable/explosive atmospheres.
- A toxic atmosphere.

The supervisor shall also assess electrical and other potential physical hazards such as piping systems, mechanical systems and the configuration of the confined space itself.

Confined Space Entry Permit

The Confined Spaces Entry Permit is a document which lists all safeguards and conditions necessary for safe entry into a confined space.

Posting Requirement

The Entry Permit will be posted at the entrance way to the confined space. After completion of the entry the Entry Permit must be returned to the supervisor designated to administer the entry permit system.

Qualifications for Confined Space Entry

All personnel who serve as authorized entrants, attendants and/ or rescue personnel shall receive annual training which shall include at a minimum:

- Review of the rescue plan and procedures developed for each type of confined space they may be entering.
- Use of emergency rescue equipment.
- Work location and confined space configuration to minimize response time.
- Content of MOSH Confined Space Entry procedures.
- Use of monitoring equipment.
- Simulated confined space entry training.
- Use of personal protective equipment.
- Respiratory protection systems (air line supplies respirators/SCBA).
- Cardial pulmonary resuscitation (CPR).

Confined Space Emergency Evaluation

During each confined space entry there must be at least one attendant. The attendant must be trained to properly use any rescue equipment provided for use and perform any other assigned rescue and emergency duties, without entering the permit space. In the event of an emergency the attendant must be able to affect notification to the 911 operator that a person has been injured or trapped in CONFINED SPACE. It is imperative that the 911 operator understand that the emergency is a CONFINED SPACE situation.

Tools and Equipment

General Care and Control of Tools

- Keep tools clean.
- Inspect tools and equipment regularly testing as needed.
- Defective tools shall be removed immediately.
- Select correct tool for the job.
- Tools shall not be thrown or dropped.
- Sharp-edged or pointed tools shall not be carried in one's pocket.
- Saws, lawn mower blades, chisels, etc., shall be sharp.
- Dull blades are not as efficient and tend to cause injury.

Hand Tools

- Never strike a steel chisel with a nail hammer. Use safety glasses or safety goggles.
- Pull wrenches, don't push them.
- Cutting bar and blades on tree trimmers shall be kept sharp and properly adjusted and maintained according to the manufacturer's recommendation.
- Use a band cutter to snap metal banding straps, not a claw hammer or crowbar.
- Never hold the work in your hand, especially when installing or removing a screw.
- Do not force a wrench with a hammer.

Portable Electric Power Tools

- Shall be equipped with three (3) wire cords and three (3) pole plugs for grounding. Exception: Double insulated tools, so marked.
- Keep in good working condition. Inspect regularly.
- Use properly grounded extension cord.
- Never wear loose clothing with free ends when operating power tools.
- Never raise or lower a tool by the electric cord.
- Power tools used outside or under wet conditions shall be plugged into a ground fault circuit interrupter.

Grinding Wheels and Wire Brush Wheels

- Inspect every three (3) months for cracks or damage, checking balance.
- Inspect wire brush for shredding and other signs of failure.
- Wear heavy duty cup-type goggles and gloves.
- Adjust work rest to 1/8 inch from grinding wheel to prevent work from catching between wheel and rest.
- Safety hoods and guards should be properly attached.
- Do not use a tool rest while operating a wire brush wheel.

Chain Saws

- All employees shall receive proper instructions before operating a chain saw or pipe saw.
- Inspect the saw frequently especially the chain.
- Wear gloves when inspecting a chain saw or pipe saw.
- Be sure oil reserve is filled.
- Clear a space in which to work. Be sure the area will ensure secure footing.
- Safety shoes, hats, gloves, glasses or goggles and chaps shall be worn. Noise protection shall be worn.
- Allow saw to cool for a minimum of two (2) minutes before refueling.

Rotary Lawn Mowers

- When operating rotary mowers, safety shoes and goggles shall be worn.
- Inspect area to be mowed before beginning. Remove any rope, string, rocks, bottles, wire, etc.
- Fuel mowers outdoors with engine off. NO SMOKING while fueling.
- Inspect the mower frequently, especially the blade. Use gloves when inspecting.
- Tractor-mower combination must have "Rollover Protective Structures" and seat belts which shall be used on the tractor.

- All operating controls on the mower shall be clearly marked.
- All safety guards shall not be removed.

Air-Powered Tools

- Inspect air hose for any defects.
- Air must be shut off before attempting to disconnect the air hose from the air line. Any air pressure inside the line should also be released before disconnecting.
- Do not disconnect the air hose from the tool to use it for cleaning machines or removing dust from clothing.

Pneumatic Impact Tools

- Do not squeeze the trigger until the tool is on the work.
- The correct eye protection must be worn. All other employees who are working in the vicinity must be similarly protected.
- Due to the excessive noise, all exposed employees must wear ear protection.
- No one should stand in front of the operator handling a pneumatic hammer.
- Jackhammers should be provided with heavy rubber grips to reduce vibration and fatigue.
- Operators should wear metatarsal-type safety shoes.

Welding and Cutting

- All brazing, cutting, welding, and burning operations should be performed only by properly trained employees in accordance with an established program.
- Objects to be welded, cut, heated, or brazed should be moved to a safe location, clear of combustible and flammable materials.
- Have portable firefighting equipment nearby in case of small fires.
- All employees and citizens must be protected from heat, sparks and slag.
- Inspect the area around the operation before leaving to make sure there are no spot fires.
- Depending on the operation, the following personal protective equipment should be used:
  - Appropriate eye and face protection.
  - Non-combustible gloves, sleeves, and apron.
  - Clothing made of non-synthetic material.
  - Respiratory protection.
- Special precaution should be taken when the operation is on closed containers or in confined spaces.
  - An exhaust or general ventilation system should be provided to maintain concentrations of toxic gases, fumes, or dust below maximum allowable concentrations.
  - If gases, dust, and fumes cannot be kept below the acceptable levels, the welder should wear proper respiratory protective equipment.
  - Where oxygen is deficient, self-contained breathing apparatus or air-supplied respirator must be worn.

Office Safety

Accidents don't just happen! They are usually the result of an unsafe act or condition in the workplace. An office can be as hazardous as a construction site if reasonable housekeeping practices are not

maintained.

- 78% of accidents are caused by unsafe acts (human factor).
- 20% of the time by unsafe conditions (mechanical failure).
- 2% of the time by storms, floods, etc. (acts of nature).

Slips, Trips and Falls

- The most common types of office accidents resulting in injuries are slips, trips and falls. The primary causes for these types of injuries are:
  - Slick wet surfaces.
  - Tripping over electrical or phone cords.
  - Tripping over wastebaskets.
  - Falling out of chairs.
  - Tripping up or down stairs.
  - Standing on office furniture to reach high places.

Prevention of these kinds of accidents is based on common sense and housekeeping practices.

- Keep your file cabinet, typewriter support and desk drawer closed when not in use.
- Electrical cords and phone cords should not be left across aisles or where someone could trip over them.
- Do not climb on chairs, desks, drawers or boxes to reach high places. Use a ladder.
- Do not tilt chairs back, keep all four legs on the ground at all times.
- Use handrails when going up and down stairs.
- When walking through office buildings keep your eyes open for wet or slippery floors and obstructions in your path.

Common sense housekeeping habits can prevent office injuries. Clean up all spills immediately. When filling a file cabinet or bookcase, start from the bottom to prevent unbalancing. Unload from top to bottom. Open only one (1) file drawer at a time to prevent the cabinet from tipping over. Always use caution when opening the top drawer of a file cabinet as it could be top heavy and fall over.

Repetitive Motion Injuries

Repetitive motion injuries are often caused by computer work or other repetitive tasks in the office. Some things you can do to prevent this kind of injury:

- Do not work for extended periods doing the same thing.
- Do not hold parts of your body in one position for extended periods of time.
- Take a five-minute (5) break every hour.

When working long hours in front of video display terminal, some ailments could be experienced such as backaches, stiff necks, eye strain and headaches. There are things that can be done which will prevent these ailments from occurring:

- Position the VDT so that you can look directly at the screen without having to lean forward or look down.
- Adjust the brightness and contrast levels of the VDT screen so that the images are bright enough so you don't have to squint. Use a glare screen if necessary, to reduce eye strain.
- Adjust the height of the keyboard so that your wrists are straight and forearms are parallel to the floor.
- Adjust the chair so that your feet are flat on the floor.

- When you have everything positioned properly, it is still very important to take frequent breaks.

To help relieve any discomforts associated with VDT operations, try some of the following exercises.

- Breathe in deeply through your nose, pushing your abdomen out as far as you can and eventually filling your chest. Hold this breath for a count of three. Exhale slowly. Do this several times during the day, at your VDT and elsewhere. It is a major stress reducer.
- Put your right elbow on your desk with your hand raised. With your left hand, gently pull back the fingers of your right hand. Hold for a count of five. Now reverse hands and repeat.
- Slowly tilt your head to one side until your right ear is over your right shoulder. Hold for a count of three. Now tilt to the left and repeat. Repeat five times. Do not roll your head back.
- Hold your arms straight out parallel to the floor. Now bring your hands to the top of your chest. From this position, push your elbows back as far as you can. Hold for three seconds. Bring your elbow forward and hold. Repeat pushing your elbows back and holding five times.
- Place your left hand on your left shoulder and your right hand on your right shoulder. Move your elbows forward and upward. Complete three backward circles. Reverse and repeat.

Electrical Safety

Do not take electricity for granted. Electricity presents both the hazard of electrocution and the hazard of fire. Remember, very small currents can kill. Know where an electrical hazard is likely to exist:

- Wiring, plugs and extension cords.
- Electric tools and equipment.
- Switches, circuit breakers, fuses and control panels.
- High-voltage equipment.
- Static electricity.
- Any electrical equipment.

Know what constitutes an electrical hazard:

- Frayed or under-gauged extension cords.
- Make sure electric tools and equipment are effectively grounded. Use Ground Fault Circuit Interrupters (GFCI) when working around water or outside.
- Maintain a sufficiently clear area around electrical equipment to permit ready and safe operation and maintenance of the equipment.
- Make sure electrical cords are not exposed to heat which can harm the insulation.
- Make sure your personal protective equipment fits properly, is kept clean and maintained in a good state of repair. When working around an electrical source, make sure your tools and clothing are free of moisture because moisture is a good conductor of electricity which could result in a deadly shock. Never work around an electrical source in the rain.
- Make sure your work area is well ventilated because dust particles, flammable vapors and excess oxygen are atmospheric hazards in which a spark could cause an explosion or fire.
- When working outside, make sure that ground-fault circuits interrupters (GFCI) are provided on electrical circuits. GFCI's are designed to limit the strength and duration of an electrical shock.
- Electrical shock is a sign that something is wrong. Any equipment which shocks when used should immediately be disconnected and then checked. Unless you are an electrician, do not attempt to repair electrical equipment.
- Never initially touch a piece of electrical equipment with the front (palm) of your hand, because the shock will cause your fingers to close on the object and you will not be able to let go.

Excavation and Trenching

The most common causes of trench and excavation cave-ins are inadequate shoring, misjudgment of soil conditions, defective shoring materials, heavy loads in the area or failure to evaluate changing weather conditions. With little or no warning, an unsupported, improperly shored or sloped trench or excavation wall can collapse, trapping the workers below.

Definition:

A trench is a narrow excavation whose depth is greater than its width, but whose width is not greater than fifteen (15) feet. An excavation is a man-made cavity or depression in the earth's surface. This may include excavations for anything from cellars to highways.

- Trenches four (4) feet or more in depth, require a safe means of exit such as a ladder, ramp, stairway or the like that is situated within twenty-five (25) feet of lateral movement. Trenches with greater length will require more ladders, etc.
- Trenches five (5) feet or greater in depth will require the proper shoring or sloping before entry can be made. Trench boxes are used in the majority of work performed by the City.
- Excavations greater than four (4) feet in depth must be tested for oxygen deficiency/hazardous atmospheres.
- All employees working in an excavation must wear a hard hat and safety shoes. Other personal protective equipment must be worn, if necessary - eye protection, gloves, etc.
- No employee will be permitted underneath loads being handled by lifting or digging equipment, nor will he/she be allowed to stand near vehicles being loaded or unloaded.

Before Excavation - Trenching

- Before the digging starts, you must do the following:
  - Call Ms. Utility to locate any underground electrical or phone cables.
  - Inspect the site for all possible hazards both at ground level and overhead.
  - All underground installations (sewer, telephone, electric, water and fuel lines) must be located and marked or staked.
  - The supervisor must choose a support system sturdy enough to withstand the pressure of the soil, taking into consideration the type of soils, vibrations from traffic, or heavy loads near the dig. Another method of insuring excavations support is to slope the sides to the "angle of repose". The angle of repose varies with different kinds of soil and should be defined for each project.

Designing Adequate Protection

- Designing a support system can be complex because of the many factors involved. Considerations to be taken into account are:
  - Soil structure. Soil structure must be carefully identified. Excavations in wet soil, sandy soil, or areas that have been back-filled are unstable and must have strong support.
  - Depth of cut.
  - Changes due to weather and climate. Excess water from rain or melting snow loosens the soil, drastically increasing the pressure.
  - Superimposed loads. Heavy equipment and materials should be kept as far from the excavation as possible. If heavy loads must be located near an excavation, the walls must be braced, sheet piled, or shored to safely support the extra weight. Buildings, trees, utility poles

and other structures adjoining the excavation area may place more stress on a trench than it can safely accommodate. Upon encountering such conditions, extra shoring, bracing or underpinning must be provided to protect the workers and prevent dislocation of the soil beneath the structures.

- " Excavation material (called spoil) can exert pressure on the excavation walls. Spoil must be stored at least two (2) feet from all sides of the trench and be barricaded or retained in an effective manner.

- C If the trench is located along roadway, pile the excavated material on the street side which will act as a barricade to keep auto traffic out of the trench. Provide adequate signs, guards, flagmen, cones, etc. to protect workers and the general public.
- C The trench and shoring must be inspected daily.
- C Vibrations from passing vehicles or heavy equipment may contribute to cave-ins. If these conditions exist near an excavation site, stronger support is mandatory.

Installing the Protection

- C Whatever support systems is used, shoring should always be applied by working down from the top of the trench. When installing the shoring, care must be taken to place the crossbeams or trench jacks in true horizontal position and to space them vertically at appropriate intervals. The braces must also be secured to prevent sliding, falling or lockouts.
- C Materials used for shoring must be in good condition, free of defects and of the right size. Timbers with large or loose knots will not be used.
- C Installing the shoring should closely follow the excavation work. It is dangerous to allow trenches to remain unshored. Even if no work is being done in them, dirt walls will slough off causing dangerous overhangs. The longer a trench is left unsupported, the greater the chance of a cave-in.
- C Special precautions may have to be taken to guard against an unstable excavation bottom, especially when the excavation is below the waterline. Sheeting may have to be driven below the bottom of such an excavation to add to the stability of the soil.
- C Diversion dikes and ditches must be used to prevent surface water from entering an excavation and to provide adequate drainage of areas adjacent to the excavation. Water-caused soil erosion and softening should not be allowed to accumulate in a trench or excavation.

After Work is Completed

- C Once work is completed, trenches should be backfilled as the shoring is dismantled. Once the trench has been cleared, shoring should be removed from the bottom up, taking care to release jacks or braces slowly. In unstable soil, ropes or chains should be used to pull out jacks or braces from above.

Inspections

- C One (1) person should be given the responsibility of inspecting shoring systems daily. This person must be trained in all requirements and be certified. Inspections are also required after rain storms or any change in conditions that can increase the possibility of a cave-in or slide. If dangerous ground movements are apparent, such as subsidence or cracks, all work in the excavation must be stopped until the problem has been corrected.

Quick Exits

- In an emergency, workers must be able to leave the trench quickly. When employees are required to be in trenches in excess of four (4) feet deep, adequate means of exits (such as a ladder or steps) shall be provided and located to require no more than twenty-five (25) feet lateral travel.
- Ladders must be in good condition, extend from the floor of the trench to three (3) feet above the top of the excavation, and be secured at the top of the trench.
- REMEMBER: REGULATIONS FOR TRENCHING AND EXCAVATION WORK LEAVE NO ROOM FOR RISK-TAKING. THEY REQUIRE THAT SAFE WORKING CONDITIONS EXIST AT ALL TIMES.

Lockout-Tagout

General

- The control of hazardous energy (Lockout/Tagout) standards covers procedures the employer must establish and follow when servicing and/or maintenance operations are conducted on machines and equipment. When the unexpected energization or start-up of the machines or equipment, or release of stored energy could cause injury to employees, OSHA requires municipalities to establish a program and utilize procedures. The program and procedures deal with affixing appropriate lockout or tagout devices to energy isolating devices, and otherwise disable machines or equipment to prevent injury to employees.
- This standard applies to the control of energy during servicing and/or maintenance of machines and equipment. Normal production operations in which servicing and/or maintenance takes place are also included under this standard if the following occurs:
  - An employee is required to remove or bypass a guard or other safety device; or
  - An employee is required to place any part of their body into an area on a machine or piece of equipment where work is actually performed upon the material being processed or where an associated danger zone exists during a machine operating cycle.
- Departments must establish a program consisting of an energy control procedure and employee training. These steps are taken to ensure that before any employee performs any servicing and/or maintenance on a machine or equipment where the unexpected energizing, start-up or release of stored energy could occur and cause injury, the machine or equipment shall be isolated, and rendered inoperative in accordance with energy control procedures.

Energy Control Procedures

Procedures are to be developed, documented and utilized for the control of potentially hazardous energy when employees are engaged in maintenance and servicing operations covered by this standard. The employee need not document the required procedure for a particular machine or equipment where all of the following elements exist:

- The machine or equipment has no potential for stored or residual energy or reaccumulation of stored energy after shutdown, which could endanger employees.
- The machine or equipment has a single energy source which can be readily identified and isolated.
- The isolation and locking out of that energy source will completely de-energize and deactivate the machine or equipment.
- The machine or equipment is isolated from that energy source and locked out during servicing and/or maintenance.

- The single lockout device will achieve a locked-out condition.
- The lockout device is under the exclusive control of the authorized employee performing the servicing or maintenance.
- The servicing or maintenance does not create hazards for other employees.
- The employee, in utilizing this exception, has had no accident involving the unexpected activation or re-energization of the machine or equipment during servicing and/or maintenance.

The procedures shall clearly and specifically outline the scope, purpose, authorization, rules and techniques to be used for the control of hazardous energy, and the means to enforce compliance including but not limited to the following:

- A specific statement of the intended use of the procedure.
- Specific procedural steps for shutting down, isolating, blocking and securing machines or equipment to control hazardous energy.
- Specific procedural steps for the placement, removal and transfer of lockout devices or tagout devices and the responsibility for them.
- Specific requirements for testing a machine or equipment to determine and verify the effectiveness of lockout devices, tagout devices, and other energy control measures.

Protective Materials and Hardware

Lockout and tagout devices are to be singularly identified, shall be the only device(s) used for controlling energy are not to be used for other purposes, and shall meet the following specifications:

- Durability
  - Lockout and tagout devices must be capable of withstanding the environment they are exposed to for the maximum period of time the exposure is expected. Tagout devices shall be constructed and printed so that exposure to weather conditions or wet and damp locations will not cause the tag to deteriorate or the message on the tag to become illegible. Tags must not deteriorate when used in corrosive environments such as areas where acid and alkali chemicals are handled and stored.
- Standardized
  - Lockout and tagout devices shall be standardized within the facility in at least one of the following criteria - color, shape or size. In addition, tagout devices must have standardized print and format.
- Substantial
  - Lockout devices are to be substantial enough to prevent removal without the use of excessive force or unusual techniques, such as by the use of bolt cutters or other metal cutting tools. Tagout devices, including their means of attachment, shall be substantial enough to prevent inadvertent or accidental removal. Tagout device attachment means shall be of a non-reusable type, attachable by hand, self-locking, and non-releasable with a minimum unlocking strength of no less than fifty (50) pounds and having the general design and characteristics of being equivalent to a one-piece, all environment-tolerant nylon cable tie.
- Identifiable
  - Lockout devices and tagout devices shall indicate the identity of the employee applying the device.
  - Tagout devices shall warn against hazardous conditions if the machine or equipment is energized and shall include a legend such as the following:
    - Do not start.

- Do not open.
- Do not close.
- Do not energize.
- Do not operate.

C When tagout systems are used, employees are also to be trained in the following limitations of tags:
  " Tags are essentially warning devices affixed to energy isolating devices and do not provide the physical restraint on those devices provided by a lock.
  " When a tag is attached to an energy isolating means, it is not to be removed without authorization of the authorized person responsible for it, and it is never to be bypassed or ignored.
  " Tags must be legible and understandable by all authorized employees, affected employees, and all other employees whose work operations are or may be in the area, in order to be effective.
  " Tags and their means of attachment must be made of material which will withstand the environmental conditions encountered in the workplace.
  " Tags must be securely attached to energy isolating devices so that they cannot be inadvertently or accidentally detached during use.
  " Tags may evoke a false sense of security, and their meaning needs to be understood as part of the overall energy control program.

Training and Communication

C The employer shall provide training to ensure that the purpose and function of the energy control program are understood by employees and that the knowledge and skills required for safe application, usage and removal of energy controls are acquired by employees.
C The training shall include the following:
  " The recognition of applicable hazardous energy sources.
  " The type and magnitude of the energy available in the workplace.
  " The methods and means necessary for energy isolation and controls.
C Each affected employee shall be instructed in the purpose and use of the energy control procedure.
C All other employees whose work operations are (or may be) in an area where energy control procedures may be utilized, must be instructed about the procedure, and about the prohibition relating to attempts to restart or re-energize machines or equipment which are locked or tagged out.

Hazardous Substances in The Workplace

The "Access to information About Hazardous and Toxic Substances Act", commonly referred to as the "Employee Right to Know Law", informs employees about chemical hazards found in their workplace and states how to work safely with these materials.

This law requires employers to inventory, collect Material Safety Data Sheets, and distribute them upon request for each hazardous substance used within their workplace. Employers must label or otherwise identify hazardous chemicals. Employees must know where to obtain information about the hazardous substances used in their workplace and be trained in the safe handling and use of those substances.

It is up to each department to comply with the "Right to Know Law" by compiling a chemical information list, requesting Material Safety Data Sheets, checking that containers are labeled and providing employees with the required training. The chemical information list is comprised of the chemicals in your work area. A copy of that list shall be maintained at your division office.

Material Safety Data Sheets for chemicals used on your job will be made available at all work sites. The products which are used should be labeled in accordance with the "Right to Know Law". The labels will contain identification of any hazardous components and the appropriate hazard warnings. Some of the products used are consumer products, and when used in a manner typical of a consumer, would not fall under the provisions of the "Right to Know Law". The warnings found on these products meet the labeling requirements.

Employee Rights

Employees have the right by law to:

- See the Chemical Information List and Material Safety Data Sheets within one (1) day of their request to the division office.
- Be provided with one (1) copy of the list of substances they use, along with any requested safety data sheets, or the means to make copies of them, at no cost, within five (5) days of a request.
- Be trained on how to identify handle, and use the hazardous chemicals in their workplace.
- Refuse to work with a specific hazardous chemical if they are denied access to the appropriate Material Safety Data Sheet or its equivalent.

Employee Responsibilities

- Learn to identify hazardous substances.
- Know when to get information about hazardous substances in the workplace.
- Learn to read, understand and follow the directions found on labels and Material Safety Data Sheets.
- Identify hazards before you start a job.
- Don't be afraid to ask questions.
- Keep your work area clean.
- Use protective clothing and equipment.
- Don't smoke, eat or drink around hazardous substances.
- Learn emergency procedures.
- Follow procedures for disposal and cleanup.
- Practice safe work habits at all times.

Chlorine Handling Training

- All personnel involved must have a clear understanding of the consequences of a chlorine leak and its effects on the body.
- All personnel involved must be aware of the operation of the detection and alarm system within the chlorine-affected space, how it functions and what to do when an alarm does sound.
- All personnel involved must be trained in the proper handling and use of the required safety equipment available and ready for use (such as self-contained breathing apparatus).
- All personnel must be made aware that chlorine tank changing and any chlorine tank or piping repair must NEVER be attempted alone.
- The attending employee must be made aware that if the person within the chlorine-affected space is rendered helpless, the first thing to do is to immediately contact the fire department or rescue unit and other personnel in the treatment facility.
- A rescue should never be attempted without a self-contained breathing apparatus that has been tested on site.

- The documented confined chlorine space entry procedure must be reviewed step-by-step and each involved party must be asked to perform the procedure properly, providing all necessary equipment. The training procedure must be performed every six (6) months and records of the session maintained. Adherence to the chlorine space entry procedure is A Matter of Life and Death and this fact must be relayed to all involved.
- Each new employee, no matter how experienced, must be trained in chlorine space entry procedure and have performed it at a training session before being allowed to enter a chlorine space.

Hazardous Material Training

- All personnel involved must be made aware of each hazardous material that may be confronted while doing their regular duties and the safety procedures to be used when the materials are encountered.
- Each employee must be trained in the use of emergency equipment such as self-contained breathing apparatus and fire extinguishers. All records of the training sessions must be maintained.

Safety for Road Construction and Repair

Advanced Warnings

- Road traffic is the number one menace in road construction, maintenance and repair. Traffic warning devices shall be installed at the start of construction or maintenance operations and shall be properly maintained and/or operated during the time when such special conditions exist. They shall remain in place only as long as needed and shall be immediately removed thereafter.
- Warning signs for maintenance and construction operations are used to notify drivers of specific hazards which may be encountered when those operations are underway.
- It will be the supervisor/crew chief's responsibility that warning devices be carried in vehicles, are properly utilized and maintained in good condition.

Traffic Barricades and Cones

- The function of cones and barricades is to warn and alert drivers of hazards created by construction or maintenance activities in or near the traveled way and to guide and direct drivers safely past the hazard. They also provide protection for men working in the roadway.

Flagmen

- Flagmen are provided at work sites to stop traffic intermittently, as necessitated by work progress or to maintain continuous traffic past a work site at reduced speeds to help protect work crews.
- Since the flagman is responsible for human safety and makes the greatest number of public contacts of all construction personnel, it is important that a qualified person be selected. A flagman should possess the following minimum qualifications:
  - Average intelligence.
  - Good physical condition including sight and hearing.
  - Mental alertness.
  - Courteous but firm manner.
  - Neat appearance.
  - Sense of responsibility for safety of public and crew.